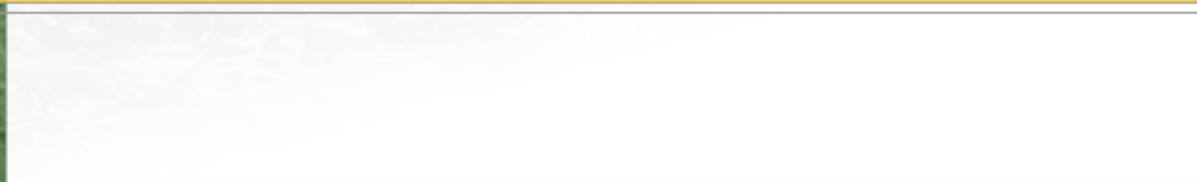




Northern Everglades Initiative Update
Tom Teets, Program Implementation Manager
Temperince Morgan, Lead Technical Program Specialist

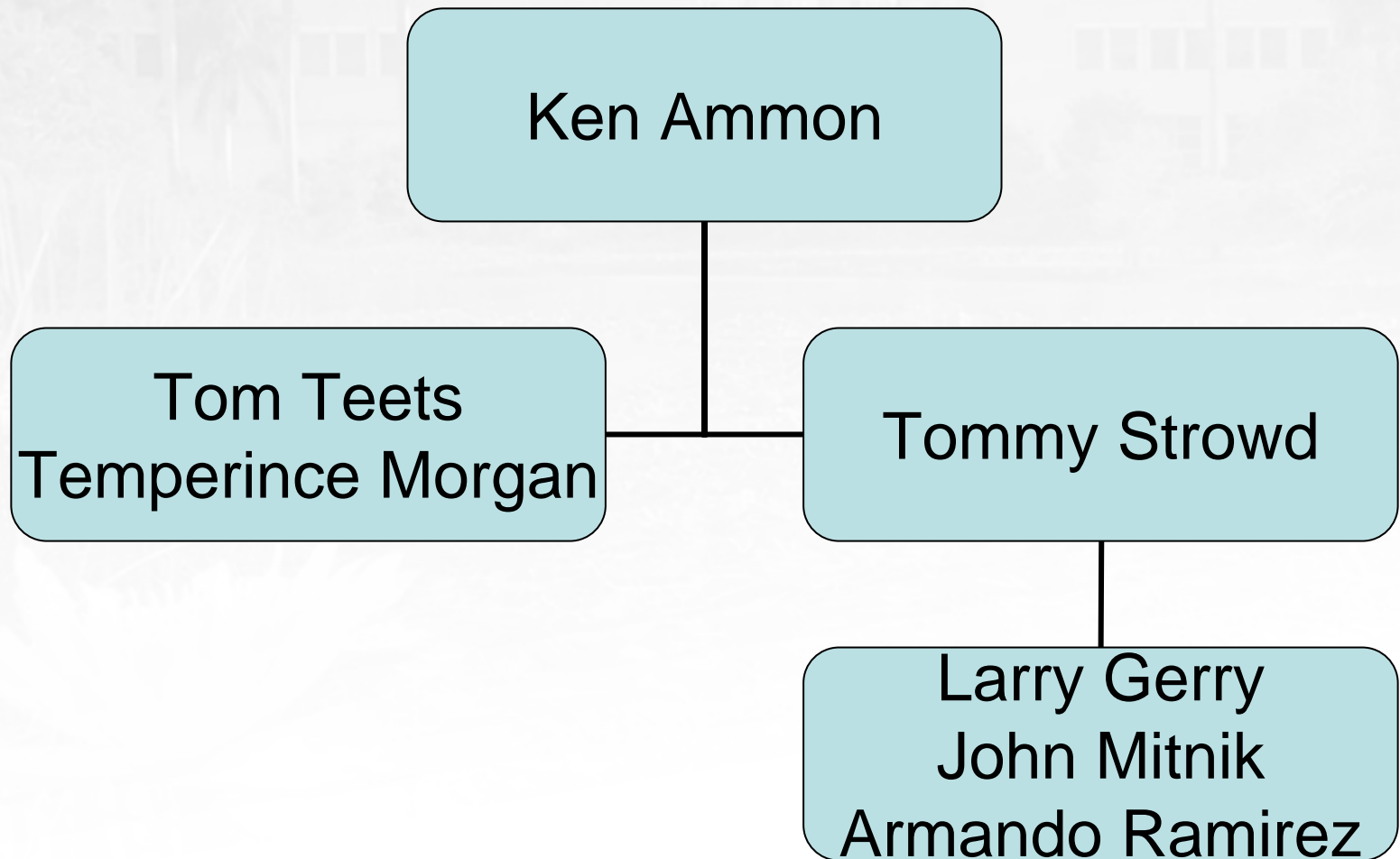
Water Resources Advisory Commission- Lake Okeechobee Committee
August 29, 2007



Northern Everglades- Phase 2 Technical Plan Organizational Overview

- **Tom Teets- Northern Everglades Program Implementation Manager**
- **Temperince Morgan- Lead Technical Program Specialist**
- **John Mitnik- Northern Everglades Division Director**
- **Armando Ramirez- Project Manager**

Everglades Restoration Resource Area-Northern Everglades



Northern Everglades Legislation

- **Expands Lake Okeechobee Protection Program to the Northern Everglades and Estuaries Protection Program**
- **Development of a technical plan to identify water quality treatment projects and water storage requirements for the Lake Okeechobee watershed by February 1, 2008**
 - **Process Development and Engineering component**
- **Development of the Caloosahatchee and St. Lucie Rivers Watershed Protection Plans to identify water quality and storage projects by January 1, 2009**

Lake Okeechobee Technical Plan Requirements

- **Identify facilities to achieve TMDL**
 - **Size**
 - **Location**
 - **Schedule**
 - **Budget**
 - **Costs**
- **Provide additional measures to increase water storage and reduce excess water levels in lake and discharges to tide**
 - **Identify storage goal to achieve desired lake levels and inflow volumes to estuaries while meeting other water related needs**

Phase II Technical Plan Lake Okeechobee Watershed

Management Measures

- Initial step compile and sort management measures by levels
- Levels of management measures
 - Level 1- Already constructed/implemented or construction/implementation imminent
 - Level 2- Construction/implementation likely; Detailed design/activity development ongoing; Location well defined
 - Level 3- Implementation certainty unknown; Conceptual level of design/activity development complete; Location defined
 - Level 4- Implementation certainty unknown- Conceptual idea; May have rough order of magnitude cost and/or general basin location
 - Level 5- Implementation certainty unknown-Conceptual idea with limited information

Management Measures and Crosswalk

- **Management Measures Spreadsheet (see handout)**
 - **Inventory of all management measures**
 - **Each management measure has-**
 - **Identification number**
 - **Sub-watershed location**
 - **Stage of implementation (levels 1-5)**
 - **Water quality and water quantity benefits**
 - **Screening results**

Management Measures and Crosswalk

- **Crosswalk to WRAC-Lake Okeechobee Committee Recommendations (see handout)**
 - **Northern Everglades Management Measure Identification number is provided beside each Recommendation in the box directly left of “Staff Eval:”**
 - **If the Recommendation was outside the scope of the Lake Okeechobee Technical Plan, then an “S” was utilized to denote “outside of scope”**

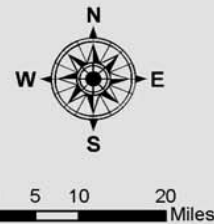
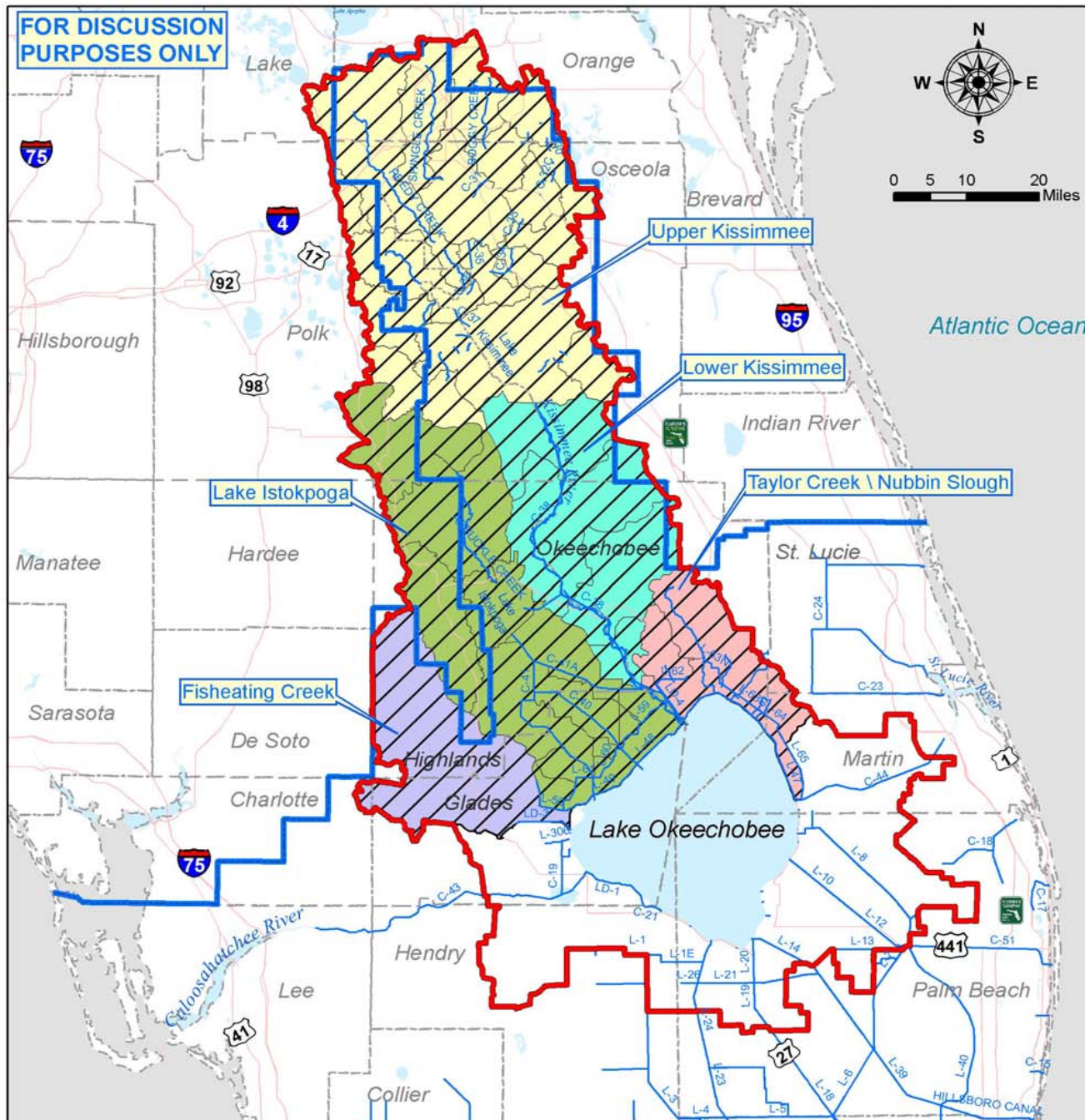
Water Quality and Quantity Analyses

- **Water Quantity**
 - **Water Budget analysis using Regional Simulation Model**
- **Model Water Quality**
 - **Spreadsheet evaluation of phosphorus reduction**
 - **Builds upon 2007 Lake Okeechobee Protection Plan Update**

Water Quantity Analysis

- **Water Budget analysis using Regional Simulation Model.**
- **Area north of Lake Okeechobee subdivided into 5 sub-watersheds**
 - **Upper Kissimmee**
 - **Lower Kissimmee**
 - **Lake Istokpoga**
 - **Fisheating Creek**
 - **Taylor Creek/Nubbin Slough**
- **Management measures with affect on water budget such as reservoirs or STAs are generally simulated as one facility per sub-watershed**

FOR DISCUSSION
PURPOSES ONLY



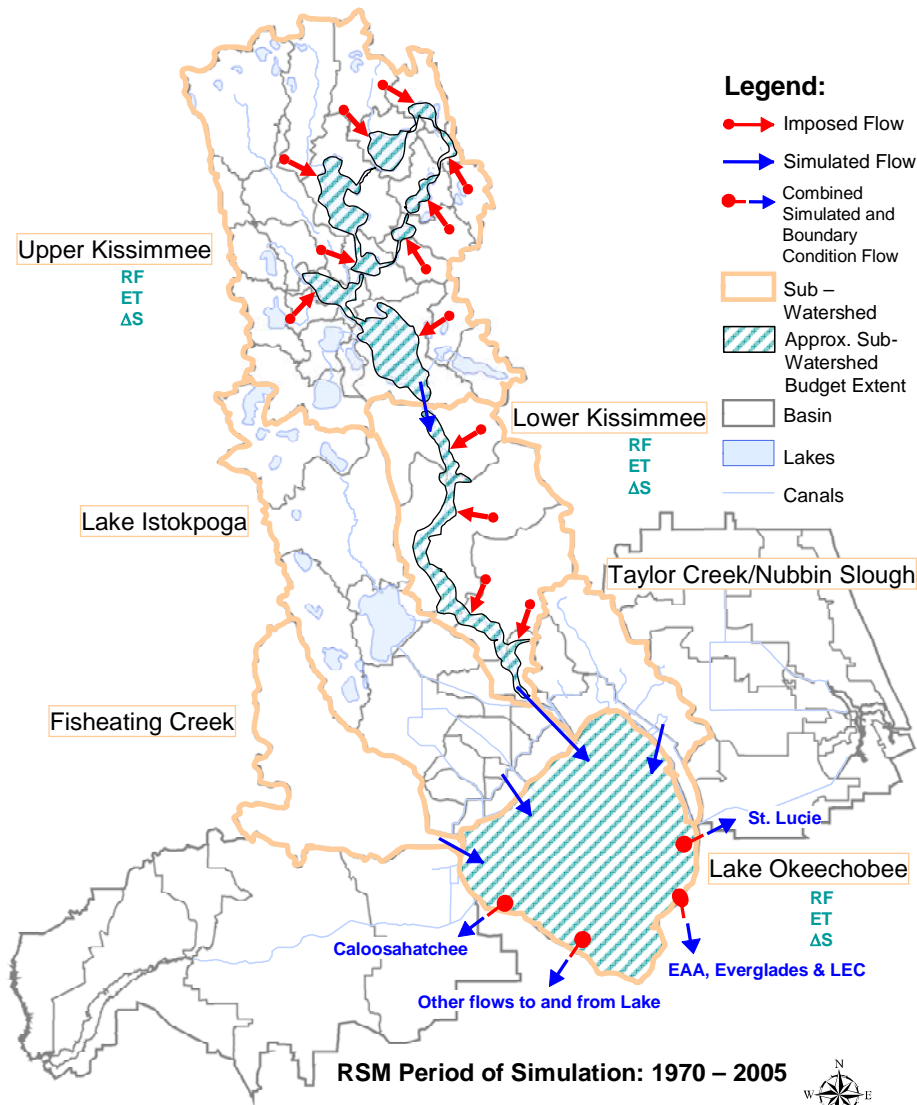
Northern Everglades Ecosystem Phase II Lake Okeechobee Watershed Construction Project

- Roads
- SFWMD Northern Border
- Lake Okeechobee Watersheds
 - Caloosahatchee River
 - EAA Basins
 - East Lake O. Basins
 - Fisheating Creek
 - Lake Istokpoga
 - Lower Kissimmee
 - St. Lucie Estuary
 - Taylor Creek/Nubbin Slough
 - Upper Kissimmee
 - West Lake O. Basins
- SFWMD Major Canals
- County Boundary
- LOPP Hydrologic Boundary
- Basins
- Regional Simulation Model - Sub Watersheds

This map is a conceptual tool utilized for project development only. This map is not self-executing or binding, and does not otherwise affect the interests of any persons including any vested rights or existing uses of real property and is not a survey.



RSM Sub-Watershed Budget Components



Note: Other flow to and from Lake = $298Dist + S236 + S4 + C10A + WS_NLOK + DMDSEM + LKTFPL + MDS - \text{backflows}$



Summary of Base Modeling Assumptions

- **Period simulation 1970-2005**
 - **Rainfall and ET data sources are consistent with those of South Florida Water Management Model**
- **Current Base (circa 2005)**
 - **Upper Kissimmee- Flow boundary conditions derived from Kissimmee River Restoration modeling**
 - **Lower Kissimmee- Phase I Kissimmee River Restoration in place**

Summary of Base Modeling Assumptions

Current Base (circa 2005) continued

- **Flow pass-through method used based on historical flow data for period of record from a sub-watershed into Lake Okeechobee for the following sub-watersheds:**
 - **Taylor Creek / Nubbin Slough**
 - **Lake Istokpoga**
 - **Fisheating Creek**
- **Lake Okeechobee-**
 - **WSE schedule**
 - **Demands on Lake derived from South Florida Water Management Model**

Summary of Base modeling assumptions

Future Base (circa 2015)

- **Full Kissimmee River Restoration including headwaters revitalization schedules**
- **Lake Okeechobee Regulation Schedule- WSE**
- **SFWMM Model run establishing boundary conditions includes Acceler 8 Projects:**
 - **A-1 EAA Reservoir**
 - **C-43 Reservoir**
 - **C-44 Reservoir/STA**
- **Authorized MODWATERs and C-111 projects**

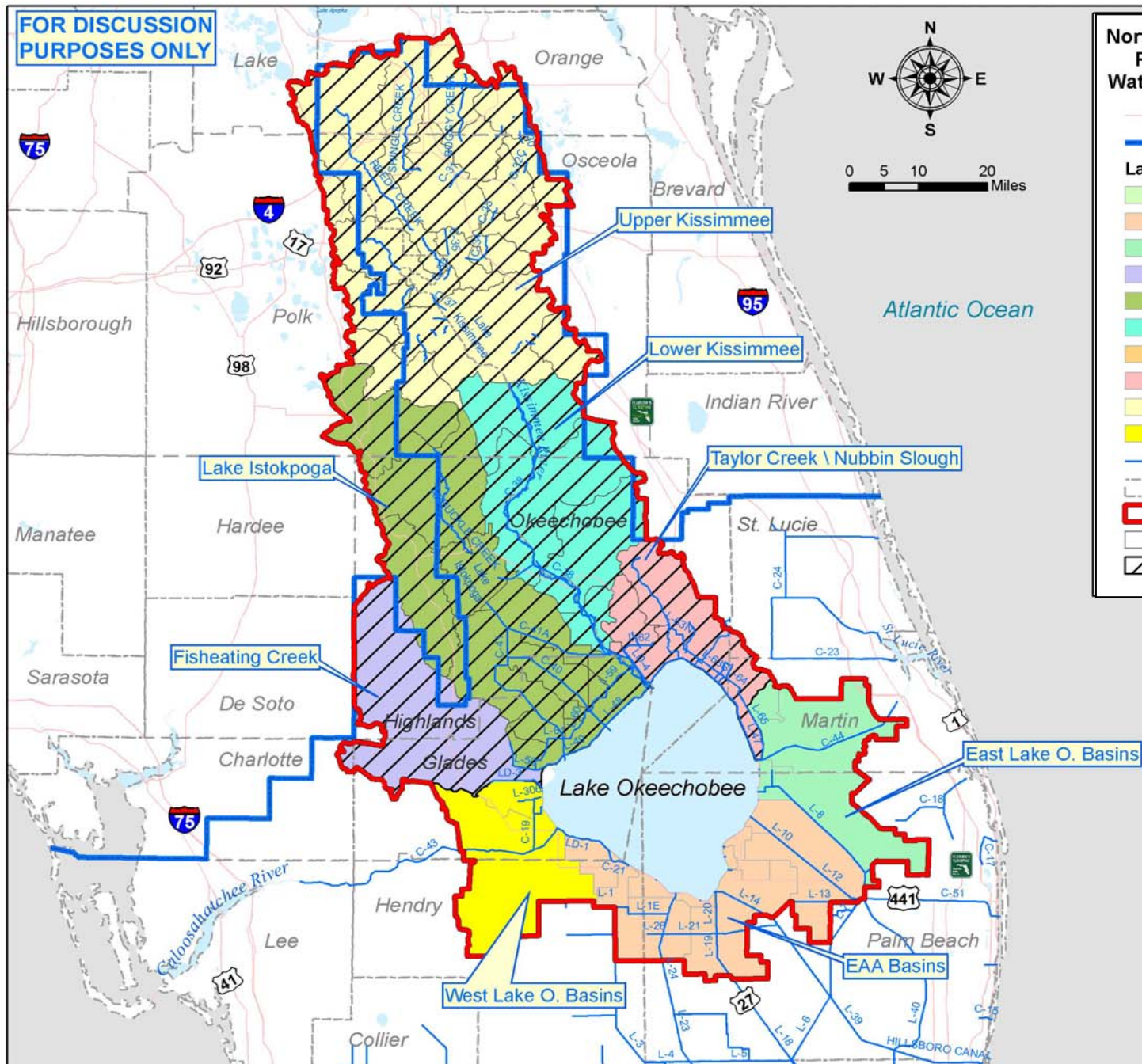
Examples of Performance Measures for Water Quantity analysis

- **Lake Okeechobee**
 - **Extreme Low and High Lake**
 - **Lake Stage Envelope**
 - **Lake Minimum Water Levels**
- **Estuaries**
 - **High/Low Discharge Criteria**
 - **Salinity Envelop Criteria**
- **Kissimmee River**
 - **Comparison with Pre-Channelization Seasonal Flow Distribution**
- **Water Supply**
 - **EAA and LOSA water supply cutbacks**

Water Quality Analysis

- **Spreadsheet analysis process**
 - **Period of record: 1991- 2005**
 - **Phosphorus reduction for each management measure estimated based upon best available information**
 - **Phosphorus reductions applied on a sub-watershed basis (8 sub-watersheds)**
 - **Shows incremental progress toward meeting Lake Okeechobee Total Maximum Daily Load**

FOR DISCUSSION
PURPOSES ONLY



Northern Everglades Ecosystem Phase II Lake Okeechobee Watershed Construction Project

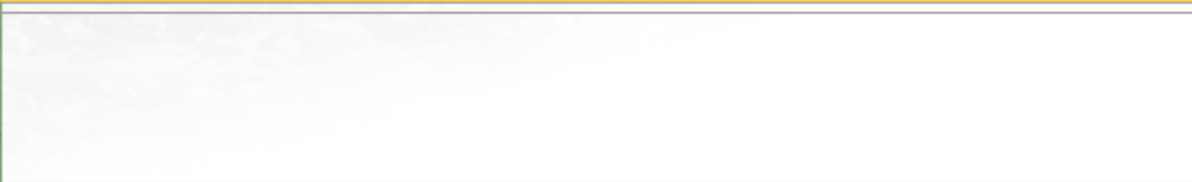
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Alternative 1



Alternative 1 Summary

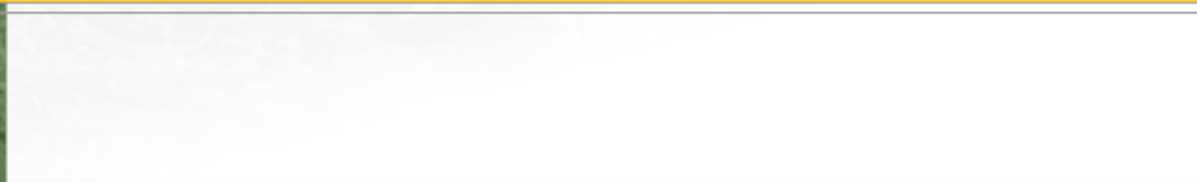
- **Alternative 1 includes-**
 - **Level 1, 2, and 3 Management Measures**
 - **CERP Lake Okeechobee Watershed Project Tentatively Selected Plan Features that were not in Levels 1-3**
 - **Kissimmee Reservoir**
 - **Istokpoga Reservoir**
 - **Istokpoga STA**

Alternative 1 Management Measures

- **Management measures applied throughout Lake Okeechobee Watershed**
 - **Source Control- Agricultural and Urban**
 - **Lake Okeechobee Works of the District**
 - **Lake Okeechobee and Estuary Watershed Basin Rules/Environmental Resources Permitting**
 - **Alternative water storage options**
- **Lower Kissimmee Sub Watershed- reservoir, ASR**
- **Taylor Creek/Nubbin Slough Sub Watershed- reservoir, ASR, STAs, water quality projects, stormwater facilities**
- **Lake Istokpoga Sub Watershed- reservoirs, ASR, STAs**



Alternative 1 Water Quality Analysis



Summary of Phosphorus Loading with Alternative 1

Initial Annual Average P Load	514 mt
TMDL Allocation	-105 mt
Remaining Load	409 mt
Load reduction from Level 1 and 2 Management Measures	-239 mt
Load reduction from Alt 1	-48 mt
Remaining Load To Be Addressed	122 mt

Alternative 1-Phosphorus Reduction Estimate in Upper Kissimmee

Initial Load- 91 metric tons

- **BMPS*-**
 - Owner implemented- 7 mt
 - Cost-Share BMPs- 8 mt
 - Additional Ag BMPs- 7 mt
- **Level 1 and 2 Management Measures- 21 mt**
- **Alternative 1 Management Measures- 6 mt**

Remaining Load- 64 metric tons

Next Steps in Formulation Process

- **Develop and analyze storage alternative**
- **Develop and analyze water quality alternative**
- **Integrate storage and water quality analysis**

Rivers Watershed Protection Plan Process

- **Project managers for District**
 - **Janet Starnes- Caloosahatchee River Watershed Protection Plan**
 - **Mike Voich- St. Lucie River Watershed Protection Plan**
- **Expanding Interagency Group to help coordinate planning**
- **Identifying the District team and developing work plan**
- **Formally kick-off in October**

An aerial photograph of a landscape. In the foreground, there are green agricultural fields divided by roads. A small settlement with white buildings is visible. In the middle ground, there is a body of water, possibly a lake or a wide river. A large, bright, puffy cloud formation is visible over the water, with rays of light emanating from it. The sky is blue with some wispy clouds.

Questions